

NEW GEOCORIS FROM THE UNITED STATES, WITH KEY TO SPECIES (LYGÆIDÆ: GEOCORINÆ)

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Geocoris omani new species

BRACHYPTEROUS FORM. Resembling rather closely in coloration *G. uliginosus* var. *limbatus* Stål. The following parts yellow-testaceous: head except eye stalk posteriorly, apical half of third antennal segment (fourth missing), narrow costal margins of corium, head beneath, legs except the lightly embrowned fore femora, anterior margin of prosternum, margins of acetabula, odoriferous orifices, and narrow lateral margins of venter. The following parts black: antennæ except apical half of third segment, eye stalk posteriorly, cicatrices to margins of pronotum and broad central disk behind these, scutellum, pleura, and venter except the forementioned parts. The following parts sordid ochraceous: anterior and posterior lateral margins of pronotum to beyond the middle, and corium except the inner fuliginous disk. Abbreviated membrane hyaline. Eye red.

Head across eyes distinctly wider than across posterior region of pronotum (1.68:1.44 mm.); eyes appearing stylate, not in contact with the rounded anterior angles of the pronotum; smooth, highly polished; sulcus shallowly continued to base of head; ocelli set a little closer to eyes than to median sulcus. Antennæ with the basal segment a little over one-half as long as second, which in turn is but little longer than third segment (fourth missing). Pronotum nearly twice as wide as long (1.44:0.80 mm.), lateral margins very gently converging anteriorly to line of the cicatrices, thence abruptly, evenly rounded to anterior margin; the extreme margins finely but distinctly carinate; the cicatrices extending to the antero-lateral punctate margins; anterior submargin before these rather sparsely punctate, broad central disk behind these more finely and more closely punctate; pale humeral area more coarsely and more sparsely punctate. Scutellum a little wider than long, strongly convex, neither elevated at base nor carinate apically, with a smooth longitudinal line running from before the middle to apex elsewhere with the disk on each side of the median line more sparsely punctate than basally and laterally. Membrane abbreviated, but nearly reaching to apex of abdomen. Hemelytra (brachypterous form) with the clavus not declivous, set off from the corium by a single row of punctures; corium strongly convex, except on basal outer third evenly and coarsely punctate; lightly expanded costal margin in outline more strongly convexly rounded behind the middle. Pleura closely and coarsely punctate. Venter smooth, finely pilose. Length of brachypterous male 3.50 mm.

Type: Male, Santa Rita Mts., Ariz., June 12, 1933 (P. W. Oman). U.S.N.M. Cat. No. 50572.

The single male with abbreviated membrane has much the color and appearance of *G. uliginosus* var. *limbatus* Stål. However, as the head is not finely rugulose and the anterior pronotal angles are distinctly rounded, it is not closely related to that species or any other known species from the United States. The head has the character of a *Hypogeocoris* with the stylated eyes, smooth, polished disk, and median sulcation, but the pronotum is so totally unlike the character of that part, both in shape and punctation, as represented in *H. piceus* Say and *H. imperialis* Dist., that I consider it a true *Geocoris*. It has been named in honor of its collector, P. W. Oman, of the Bureau of Entomology.

Geocoris beameri new species

Similarly colored and with same general broad form as the palearctic *Geocoris erythrocephalus* Lep. Shining black. The following parts yellow-testaceous: head except transverse basal mark which at each end extends forward a short distance next to the ocelli, antennæ for the most part, a slight submarginal longitudinal streak of pronotum, and extreme apex of scutellum. The following part black: transverse basal mark of head, pronotum except for submarginal yellow streak, scutellum except at apex, the corium except for the embrowned lateral margins, pleura except parts hereinafter mentioned, and all of the venter. The following parts, beneath, pale straw-yellow: head, rostrum, legs, broad margins of the acetabula, odoriferous orifices, and posterior angles of the metapleura. Membrane hyaline, embrowned at base. Eyes and ocelli red.

Head smooth, polished, short and broad; two and four-fifths times as wide across eyes as long, scarcely wider than width of pronotum posteriorly, the longitudinal sulcus of the tylus continued as a fine groove nearly to base; anterior margins between eyes and tylus more straight, much less oblique than in *bullatus* Say or *uliginosus* Say; eyes almost or quite in contact with anterior angles of pronotum; ocelli set a little closer to eyes than to median line of head. Lengths of segments of antennæ as follows: I, 0.24, II, 0.44, III, 0.36, IV, 0.48 mm. Lengths of segments of rostrum as follows: I, 0.40, II, 0.28, III, 0.40, IV, 0.40 mm. Pronotum broad, not quite twice as wide as long (1.60: .812 mm.); lateral margins very nearly parallel posteriorly for three-fourths of their length, the anterior one-fourth behind the eyes abruptly converging but not angulated to anterior margin of pronotum; the cicatrices situated one fourth the way from anterior margin, transverse, not extended to lateral margins; areas before and behind cicatrices rather evenly and closely punctate, more sparsely punctate on pale submarginal streak. Scutellum a little wider than long, equal in length to pronotum, subbasally transversely elevated, followed by a slight longi-

tudinal median carina to apex, coarsely punctate across base and on each side of median carina. Hemelytra with the clavus provided with the usual row of punctures, corium inwardly close to the claval suture provided with two regular rows of punctures; outer apical half rather closely punctate, preceded by a few scattered punctures, longitudinal central disk smooth, impunctate; costal margin slightly expanded, set off by a row of punctures. Membrane extended slightly beyond apex of abdomen, hyaline, embrowned at base. Pleura coarsely and closely punctate. Venter finely pilose in the center. Length 3.70 mm., diameter across humeral angles of pronotum 1.60 mm.

Type: Male, Yarnell, Ariz., July 25, 1932 (R. H. Beamer).
Allotype: Same data as type. *Paratypes*: 2 females, same data as type; 1 female, Sabino Canyon, Santa Catalina Mountains, Ariz., June 27, 1933 (R. H. Beamer). Collection of University of Kansas. One paratype from Yarnell deposited in the collection of the U. S. National Museum, Cat. No. 50573.

Quite distinct from any described species from the United States, resembling in appearance the palearctic *Piocoris erythrocephalus* Lep. and most closely related to *G. scudderi* Stål. It has been named in honor of its collector, Prof. R. H. Beamer, of the University of Kansas, who has kindly sent four specimens for examination.

***Geocoris davisi* new species**

Color testaceous-yellow, not highly polished, finely sparsely pilose on head, pronotum, and scutellum; a slight fuscous line on each side of tylus, two small clusters of fuscous punctures before posterior margin of pronotum, and a few fuscous punctures on base and lateral areas of the scutellum. Beneath in the main concolorous, mesosternum and metasternum and the venter laterally embrowned. Legs yellow-testaceous. Antennæ embrowned, with the basal segment mostly pale.

Head with the disk, except at base, very finely granulose; tylus lightly longitudinally sulcate, devoid of a longitudinal sulcus through vertex; anterior margins between eyes and tylus less strongly oblique than in *bul-latus* Say. Eye stalk in contact with anterior angles of pronotum. Ocelli placed much closer to eyes than to median line of head. Lengths of antennal segments as follow: I, 0.24, II, 0.44, III, 0.28, IV, 0.44 mm. Lengths of segments of rostrum as follows: I, 0.48, II, 0.28, III, 0.40, IV, 0.32 mm. Pronotum finely sparsely pilose, not twice as wide as long (1.40: .80 mm.); lateral margins gently converging anteriorly, edges lightly carinate, anterior fourth, before the position of the cicatrices, abruptly subangularly converging to anterior margin of pronotum; except for the cicatrices and humeral angles, closely and evenly punctate. Scutellum a trifle longer than wide, a

smooth somewhat oblique calloused area in each basal angle, posteriorly with a subcarinate smooth longitudinal median line; sparsely punctate at base, more closely so laterally on either side of the median carina. Hemelytra with the clavus provided with the usual row of punctures; corium with two rows of punctures next to the claval suture; the central disk smooth, beyond which in the outer apical half is a rather closely punctate area; outline of costal margin rather strongly convexly arcuated. Membrane clear hyaline, extended but little beyond apex of abdomen. Pleura closely punctate. Venter with a sparse coating of fine, incumbent hairs. Length 3.70 mm., diameter across humeral angles of pronotum 1.40 mm.

Type: Female, Las Vegas, Nev., Sept. 15, 1931 (E. W. Davis). Paratypes: 4 females, Las Vegas, Nev., June 15, 1932 (E. W. Davis); 2 females, Overton, Nev., June 15, 1930 (E. W. Davis). Collected on *Dondia nigra* and *Atriplex garrettii* (family Chenopodiaceæ). U.S.N.M. Cat. No. 50574.

Most closely related to *G. pallens* Stål (= *decoratus* Uhler), from which it is distinguished, besides its color and pilosity, by the much more arcuate margins of the corium, in less obvious angulated antero-lateral angles of the pronotum, and the callosities of the scutellum. Named in honor of its collector, Mr. E. W. Davis, of the Beet Leafhopper Laboratory at Salt Lake City, Utah.

Geocoris nanus new species

Geocoris bullatus bullatus McAtee (Part)

Griseous, punctate with ferruginous; head finely grayish pilose; except for pale tylus and small area either side of it, cicatrices, scutellum basally, and tergum except paler terminal segment, reddish-castaneous; beneath reddish-castaneous, with the following parts pale yellow-white: A more or less evident line beside the eyes, the anterior margin of the prosternum, margins of the acetabula, odoriferous orifices, posterior margins of the propleura and metapleura. Venter reddish-castaneous. Antennæ for the most part, basal two segments of the rostrum, and the legs, testaceous; terminal segment of the antennæ infuscated. Membrane hyaline.

BRACHYPTEROUS FORM: Head a little over twice as wide across eyes as long and plainly wider than pronotum posteriorly; not polished, very finely granulose and finely grayish-pilose; tylus lightly longitudinally sulcate, suclus not continued through the vertex; ocelli situated much closer to eyes than to middle line of head; eyes not substylate, almost or quite in contact with anterior angles of the pronotum. Lengths of antennal segments as follows: I, 0.20, II, 0.36, III, 0.24, IV, 0.40 mm. Lengths of segments of rostrum as follows: I, 0.36, II, 0.28, III, 0.36, IV, 0.28 mm. Pronotum finely pilose anteriorly, much wider than long (1.0: .60 mm.); lateral

margins very lightly carinate, posteriorly parallel, anteriorly behind the eyes abruptly rounded, not angulated to anterior margin; cicatrices widely separated by a punctate area, not nearly attaining lateral margins; surface before cicatrices closely punctate, behind these more sparingly punctate with ferruginous. Scutellum finely pilose, rather flat, as long as wide, very slightly elevated at base, provided with a smooth longitudinal noncarinate line from before the middle to apex; rather closely punctate basally and on each side of the smooth median line. Hemielytra dorsally strongly convex, apex just surpassing posterior margin of fourth visible abdominal segment; clavus level with corium and set off by a closely set row of punctures; corium, except along narrowly expanded costal margin, rather closely and evenly punctate with ferruginous; posterior margin truncate beyond the inner broadly rounded angle; membrane clear hyaline, abbreviated, about as long as the diameter of the clavus at base. Tergum finely, closely grayish pilose. Pleura finely pilose; except on the smooth pale areas, closely and coarsely punctate. Venter rather densely but finely grayish pilose. Length of male 2.80 mm., diameter across humeral angles of pronotum 1.0 mm.

MACROPTEROUS MALE: With much the same general pattern of coloration, except that the pronotum and corium are more testaceous and the head beneath pale. The head is a little less wide in relation to its length; pronotal margins more evidently carinate, the scutellum plainly longer than wide, with a more evident longitudinal carina. The hemielytra are longer, extended as far as the middle of the fifth visible abdominal segment, the costal margins more expanded and in outline less convex; the clavus is declivous, the corium punctate as in other species of *Geocoris*. Membrane hyaline, extended a little beyond apex of abdomen. Length 3.00 mm.

Type: Male, Mustang Mts., Ariz., June 12, 1933 (P. W. Oman). Paratypes: Males, 7 with the same data as type (all brachypterous); 1 Sierrita Mts., Ariz., Nov. 27, 1913 (H. S. Barber) (macropterous); females, 7 with the same data as type; 1 Ft. Collins, Colo., C. F. Baker; 2 labeled A. Lam., 7-7-1 (locality unknown). U.S.N.M. Cat. No. 50575.

Paratypes in the University of Kansas: Males, 7 Mustang Mts., Ariz., June 12, 1933; 1 Sabino Can., Santa Rita Mts., Ariz., June 22, 1933; females, 4 Mustang Mts., Ariz., June 12, 1933; 1 Apache Co., Ariz., Aug. 16, 1927; Navajo Co., Ariz., Aug. 15, 1927; Beboquivari Mts., Ariz., July 19, 1932 (R. H. Beamer) (all brachypterous).

This small species is most closely related to *G. frisoni* Barber, from which it may be distinguished, besides its color and pilosity, by the narrower head and pronotum, and the more nearly truncate posterior margin of the corium in the brachypterous form.

The specimen from Ft. Collins, Colo., is more robust and more deeply colored, the head provided with an ochraceous spot behind each ocellus. One of the two more robust specimens from an unknown locality labeled "A. Lam. 7-21-1" was treated by McAtee (Proc. Biol. Soc. Wash., XXVII, p. 131, 1914, as a brachypterous form of *Geocoris bullatus* Say.

Geocoris paulus McAtee

Geocoris punctipes var. *paulus* McAtee, Proc. Biol. Soc. Wash., XXVII, p. 130, 1914.

After an examination of the type (female) from Kern Co., California, in the collection of the National Museum, I am convinced that this is quite distinct from *punctipes* Say and should be given specific rank. In *G. paulus* the head is not polished but very finely rugulose, devoid of a distinct median longitudinal sulcus continued from tylus to base of head, which is so evident in Say's species. *G. punctipes* differs from all other species from the United States in having a transverse, arcuate sulcus behind the tylus which does not reach the eyes. Furthermore, in McAtee's species the antero-lateral margins of the pronotum are gently rounded from just before the middle to the anterior margin, where the eyes are not remote but in contact with it. In addition, the scutellum is devoid of the basal callosities so characteristic of *G. punctipes*.

Geocoris frisoni Barber

Geocoris frisoni Barber, Bul. Bklyn. Ent. Soc., XXI, p. 38, 1926.

This small pale-testaceous species was originally described from Illinois. It is evidently a rather widely distributed species, as there is a female specimen in the National Museum collection taken by E. A. Schwarz at San Diego, Tex. Also Prof. R. H. Beamer, of Kansas University, collected three specimens in Texas: Kendall County, July 22, 1928, Brooks County., July 25, 1928, and Karnes County, July 23, 1928. All specimens of this species so far seen are brachypterous.

KEY TO UNITED STATES SPECIES OF GEOCORIS

1. Head smooth, polished, not at all granulose, with a fine, longitudinal sulcus extending from sulcation of tylus through vertex2

- Head very finely granulose, sulcus of tylus not continued through vertex5
- 2. Head concolorous with pronotum; a distinct, transverse, arcuate sulcus behind tylus, not attaining eyes. Basal angles of scutellum with distinct pale calloused areas*punctipes* Say
- Head ochraceous or reddish-ochraceous, devoid of transverse, arcuate sulcus. Scutellum noncalloused, unicolorous, black3
- 3. Broad form; width of head across eyes scarcely greater than pronotum posteriorly; eyes in contact with abruptly rounded anterior angles; pronotum almost twice as wide as long. Scutellum noncarinate apically*beameri*, n. sp.
- Narrower form; width of head across eyes plainly greater than pronotum posteriorly4
- 4. Pronotum bicolorous, antero-laterally gently symmetrically rounded, eyes not in contact with pronotum. Scutellum strongly convex, not carinate apically. (Brachypterous)*omani*, n. sp.
- Pronotum black, antero-laterally more abruptly rounded, eyes in contact with pronotum. Scutellum distinctly carinate apically*scudderi* Stål
- 5. Species either mostly black or mostly griseus with prominent fuscous markings. Antero-lateral margins of pronotum distinctly angulated (*atricolor* Mont., *uliginosus* Say, *bullatus* Say, *discopterosus* Stål, *pal-lens* Stål (= *decoratus* Uhl.), *lividipennis* Stål, and *carinatus* McAtee)*
- Species pale, testaceous or griseus without prominent fuscous or black markings. Antero-lateral angles of pronotum either rounded or not distinctly angulated6
- 6. Posterior margin of corium evenly, symmetrically rounded, brachypterous. Eyes not in contact with antero-lateral angles of pronotum, which are abruptly rounded; cicatrices of pronotum almost contiguous. Scutellum shorter than pronotum. Small species*frisoni* Barb.
- Posterior margin of corium at least outwardly truncate in both brachypterous and macropterous forms7
- 7. Head and pronotal cicatrices castaneous-red or ochraceous-red. Pronotum parallel sided, antero-lateral angles abruptly rounded; posterior margin before scutellum slightly concave. Eyes in contact with pronotum. Pronotal cicatrices remote from each other*nanus*, n. sp.
- Head and cicatrices concolorous with pronotum. Pronotum not parallel sided; posterior margin before scutellum truncate8
- 8. Pronotum with lateral margins gently, evenly rounded anteriorly from just before middle point. Eyes in contact with antero-lateral angles. Nonpilose*paulus* McAtee
- Pronotum with antero-lateral margin abruptly, subangularly rounded. Eyes in contact with pronotum. Head, pronotum, and scutellum finely, sparsely pilose*davisi*, n. sp.

* See Key—McAtee, Proc. Biol. Soc. Wash., XXVII, 1914, p. 128.